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THE COST OF GOVERNMENT IN MINNESOTA

An investigation has recently been completed, by authority of the Minnesota Tax Commission, relating to the total cost of all grades of government, and also the cost in each of 326 incorporated places in Minnesota during the fiscal year 1911.¹ Some of the facts brought to light by this investigation, especially as to the variation of cost with size of city, are of sufficient theoretical interest to students of public finance to warrant a more extended analysis than could be given in an official report.

In most investigations of cost of government, expenditures have been taken as the measure of cost. If all governmental units of like grade had identical functions, this measure might serve, at least for the purpose of comparison. In point of fact, however, an extraordinary variety of functions is found, especially in the matter of municipal trading. One city owns water and light plants, a public market, an auditorium, and perhaps still other public service enterprises, which are financed chiefly, or it may be entirely, from the sale of commodities or services; another city has none of these things and relies exclusively on the proceeds of taxation. If expenditures be taken as the measure, the cost of government will necessarily appear to be enormously greater in the first city than in the second: yet the tax levy may be much lower in the city having the higher apparent cost of government. Moreover, it is perfectly apparent that what a man pays for water and light is no more a part of the cost of government than are his similar payments for groceries and dry goods; and this is equally true, whether the water and light plants are operated by a private corporation or by the city. No mere change in ownership of such enterprises can change the character of the consumer's expenditure; any more than the establishment of a municipal milk supply could suddenly transform another private household expenditure into a part of the cost of government. In all these cases the purchaser merely pays for value received, that is, for a commodity or a special service. The transaction is, therefore, purely private and commercial in character, irrespective of whether the seller be an individual, a private corporation, or a public corporation. Consequently, all forms of municipal trading figure in the cost of government only in the event and to the extent that they fail to be self-supporting and become a charge on the general revenues.

¹ "The Cost of Government in Minnesota," by E. V. Robinson, ch. 15 (pp. 242-587) of the *Report of the Minnesota Tax Commission* (St. Paul, 1912).

In like manner, when a man pays a special assessment for a ditch, or sewer, or sidewalk, he is helping to pay for a public improvement which is supposed to increase the selling value of his property by at least the amount of his assessment. In case it does this, he gets back, in another form, all that he pays. Only in case he is assessed more than the benefit to his property is he taxed at all, while in all cases where he is assessed less than the benefit to his property, he actually profits by the transaction. It is clear, therefore, that special assessments, unless in excess of benefits to the property, are not a part of the cost of government.

For these reasons, it is essential, in order really to arrive at a common measure of the cost of government, to keep the finances of public service enterprises distinct from general public finances; and also sharply to separate special assessments from taxes, special assessment loans from general loans, and interest payable on special assessment loans from interest on general loans.

Owing to the foregoing considerations, receipts of local coercive revenues—taxes, licenses, fees and fines, paid within the area governed—were taken as the measure of the cost of government in Minnesota. This measure, it is true, does not show how rapidly debt is being piled up: but neither would a statement of expenditures show the relation between general revenues or ordinary receipts, on the one hand, and payments for current expense and interest, on the other. In order to bring out this relationship, which is the really vital thing in connection with debt, the ratio of current expense and interest to general revenues (exclusive of commercial receipts and special assessments) was calculated for each of the 143 municipalities having over 1,000 population. The cost of government measured by coercive revenues, and the per cent of current expense and interest to general revenues, taken in connection with one another reveal the character of the financial operations of the year at a glance.

The usual practice has been to employ only the per capita basis for comparison, owing to the lack of reliable data as to the true valuation of property. This is the case with the census statistics of cities, and with most if not all of those published by the various states. In Minnesota, however, the tax commission had for some years compiled records of real estate sales, including about 250,000 transfers. These records from January 1, 1910, to January 1, 1912, were used to find the ratio of assessed to true valuation of real estate in each city and village, each county, and in the state as a whole. The true valuation of all property was then obtained

by employing a fixed ratio (28 per cent) of assessed to true valuation for all personal property actually appearing on the tax rolls, aside from money and credits which are taxed at a different rate. In this way it becomes possible to compare the costs of various grades and units of government with reference not only to population but also to wealth.

On applying the methods outlined above, the cost of all grades of government to the taxpayers of Minnesota, during 1911, was found to have been as indicated in the following table (p. 818). Items I and II refer to disbursements; items III and 4 (under D) to the burden borne by taxpayers. The essential difference between item III and item 4 is that the former includes the general property tax, federal taxes, gross earnings taxes, licenses, fees, and fines; while item 4 includes only the proceeds of the general property tax and federal taxes. Diagram 1 is based on item III of the table; diagram 2, on item 4.

The returns for individual cities given in the chapter on cost of government represent a consolidation of city accounts with those of school districts and, in many instances, with the transactions of independent municipal boards. Such consolidation presented difficulties owing to the fact that the school districts seldom exactly coincide with the municipality. In some cases a city contains three or four school districts. More often the district is larger than the city; and in some instances one district covers twenty or thirty townships and includes a considerable number of cities and villages. The object of such an arrangement is to compel outlying iron-ore lands to help maintain the schools. Wherever municipal and district boundaries were found not to coincide, the method of procedure was as follows: (1) to total the receipts and the payments of all school districts containing any part of the municipality; (2) to ascertain the assessed valuation of the district or districts, on the one hand, and the municipality on the other; (3) to obtain the ratio of municipal to district valuation; (4) to take the same per cent of the joint district receipts and payments respectively. The resulting sums indicate with substantial accuracy, it is believed, what was actually collected and spent within the city or village for both municipal and school purposes. The same plan was used in consolidating the outstanding debts and the annual interest charges of cities and districts.

Previous investigations have shown that, on the average, the cost of government increases faster than the size of the city. The same relation is also found to exist in Minnesota, as shown by

TABLE 1.—*Cost of all grades of government, in 1911, to taxpayers of Minnesota. (Report of Minnesota Tax Commission, 1912, page 279.)*

Items	Local	County	State	Federal ¹	All grades
A. Amount for each grade of government:					
I. Total payments (including duplications) . . .	\$47,518,000	\$41,787,000	\$16,598,000	\$21,759,000	\$127,664,000
II. Net " (excluding ") . . .	43,714,000	9,312,000	10,911,000	20,927,000	87,865,000
III. Cost to taxpayers (total coercive revenues) . . .	26,760,000	6,853,000	9,315,000	14,779,000	56,708,000
B. Per cent for each grade of government:					
I. Total payments (including duplications) . . .	37.2	32.7	13.0	17.1	100
II. Net " (excluding ") . . .	53.2	10.6	12.4	23.8	100
III. Cost to taxpayers (total coercive revenues) . . .	47.2	10.3	16.4	26.1	100
C. Per Capita for each grade of government:²					
I. Total payments (including duplications) . . .	\$22.55	\$19.83	\$7.88	\$10.33	\$60.59
II. Net " (excluding ") . . .	22.17	4.42	5.18	9.93	41.70
III. Cost to taxpayers (total coercive revenues) . . .	12.70	2.78	4.42	7.01	26.91
D. Cost to taxpayers measured by area, true valuation, capitalistic income, and average family:					
1. Cost to taxpayers per square mile	\$330.95	\$72.39	\$115.21	\$182.78	\$701.83
2. Cost to taxpayers per \$10,000 true valuation . . .	71.71	15.69	24.96	39.61	151.97
3. Per cent which cost was of income from } total wealth at 5% interest: ³ }	11.1	2.4	3.9	6.2	23.6
4. Cost to family of five on \$3,000 of real estate } and \$1,000 of personal property (true valuation } under general property tax and federal } taxes. ⁴ }	\$24.41	\$6.08	\$4.59	\$35.06	\$70.13

¹ Proportionate share of Minnesota on basis of population in 1910 (U. S. 91,972,266; Minnesota 2,075,708=2.257 per cent).

² Based on estimated population of 2,107,042 in 1911 (Table I, ch. 15, *Report of the Minnesota Tax Commission*, 1912).

³ Estimated wealth in 1911, \$4,796,399,264 (Analysis Table D, ch. 15, *ibid.*)

⁴ At average ratio of assessed to true valuation for real estate (33.41 per cent) and personal property (28 per cent) less exemption of \$100=\$1,182.30 assessed valuation, and average tax rate (29.67 mills) which prevailed in state in 1911, distributed as per state auditor's abstract of tax lists, viz.: state taxes 3.88 mills; county taxes, 5.14 mills; and local taxes, 20.65 mills.

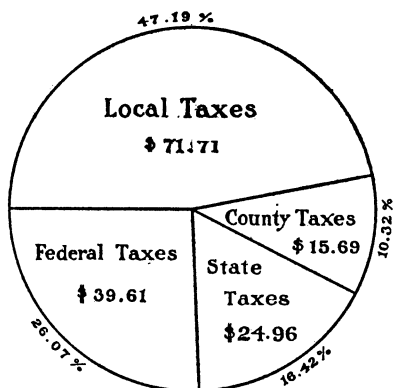


Diagram 1: Cost of all grades of government in 1911 to taxpayers of Minnesota, per \$10,000 of true valuation.

Total cost \$151.97.

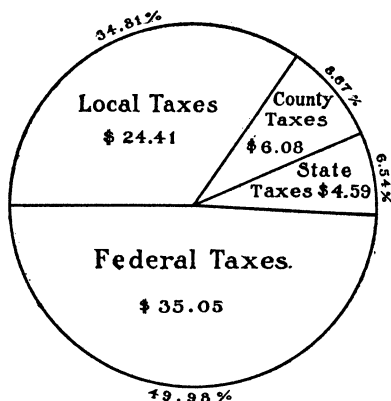


Diagram 2: Cost of all grades of government in 1911 to family of five in Minnesota, owning \$3,000 of real estate and \$1,000 of personal property, at average ratio of assessed to true valuation and average tax rate prevailing in the state. This diagram excludes state corporation taxes, licenses, fees and fines.

Total cost to family of five \$70.13.

Table 1 and diagrams 1 and 2 of course include only taxes received by the government, not the tribute paid to protected industries by consumers because of the protective tariff. How much this is cannot be ascertained. However, if such tribute bears approximately the same relation to the customs revenue of the government that the volume of domestic commerce does to the volume of foreign commerce (estimated at 12 to 1), then the family of five, represented in diagram 2, paid to protected interests \$168.44 against \$70.13 for the support of all grades of government. Any assumption of this sort is, of course, highly uncertain; but it may be noted that on this basis, the total burden borne by a family of five in Minnesota owning \$4,000 worth of property would amount to \$238.57; and that of this sum, 70.61 per cent would be for the support of protected industries.

the higher per capita cost in the larger cities. The explanation of this fact is presumably the greater number of things which the larger city does for the safety, health, and comfort of the citizen—things which in smaller municipalities are either done by the citizen himself or are not deemed necessary. It may be noted that an increasing cost per capita with increase of population is therefore not at all inconsistent with the assumption that municipal activities severally conform to the law of diminishing expense which would be expected to obtain in similar undertakings under private management.

On the other hand, it appears from this investigation that in Minnesota, at least, the cost of municipal government increases much less rapidly than wealth. In other words, while average cost per capita varies directly, average cost measured by true valuation varies inversely, with the population.

For example, in the three large cities in the state, the cost of city government (including schools) based on true valuation, varied inversely with size: being \$104.02 per \$10,000 true valuation in Minneapolis; \$110.16 per \$10,000 true valuation in St. Paul; \$112.68 per \$10,000 true valuation in Duluth. Maintenance charges for government in general and public service enterprises also varied inversely with the size of the city, being least in Minneapolis and greatest in Duluth. So likewise did total maintenance charges and interest, which constitute the expenditures for current government. The amount was, for Minneapolis, \$107.49, for St. Paul, \$123.57, and for Duluth, \$124.12 on each \$10,000 of true valuation.

Maintenance charges for health and sanitation, unlike maintenance in general, varied directly with size, the figures being \$9.62 for Minneapolis, \$8.86 for St. Paul, and \$4.63 for Duluth, on each \$10,000 of true valuation. A similar gradation exists on the basis of population, the per capita expenditures being \$1.59 in Minneapolis, \$1.20 in St. Paul, and \$0.79 in Duluth. Such striking variation of health and sanitation charges with the size of the city apparently testifies to the seriousness of the health problems which arise from the crowding together of a large population in a limited area.

It is, however, in the relation of average costs for the several classes of municipalities that the most significant facts appear, as shown by the table on the following page. Class 1 as here used includes Minneapolis, St. Paul, and Duluth; class 2, 17 cities and villages between 20,000 and 5,000 population; class 3, 23 cities and villages between 5,000 and 2,500; class 4, 89 cities and villages between 2,500 and 1,000; and class 5, 178 villages having less than 1,000 population. In all cases it was necessary to eliminate the mineral cities, since their huge valuations and high per capita costs would render all averages meaningless. True valuations were not calculated for class 5. The figures for this class consequently had to be gotten by various indirect methods and are therefore less reliable than those given for classes 1 to 4, inclusive.

The same relation of cost to size is thus found between the

TABLE 2.—Showing the average relation of size of city to cost of government in 310 cities and villages of Minnesota, excluding those having mineral valuations.

	Average Class 1	Average Class 2	Average Class 3	Average Class 4	Average Class 5
Cost to local taxpayers					
per \$10,000 true valuation	\$107.20	\$127.10	\$133.83	\$135.85	. . . . .
per capita	16.65	12.01	11.42	11.27	. . . . .
Payments for maintenance and interest					
per \$10,000 true valuation	\$114.94	\$158.90	\$192.08	\$190.25	. . . . .
per capita	17.86	15.03	16.39	15.79	. . . . .
Ratio of maintenance and interest to revenue	74.9	79.4	83.1	88.3	. . . . .
Receipts from public service enterprises					
per \$10,000 true valuation	\$15.37	\$34.95	\$63.24	\$45.44	. . . . .
per capita	2.39	3.30	5.40	3.77	. . . . .
Per cent of public service payments covered by receipts	86.2	88.0	81.6	72.6	67.4
Per cent of assessed to true valuation	38.77	32.79	30.92	30.17	. . . . .
True valuation per capita	\$153.99	\$945.26	\$853.50	\$829.79	. . . . .
True tax rate (city and school)	9.36 mills	10.38 mills	9.66 mills	10.40 mills	. . . . .
Per cent of net debt to true valuation	3.6	2.9	3.4	3.1	. . . . .
Per cent of net interest to levy for city and schools	16.6	13.1	16.3	14.0	. . . . .

¹ Estimated. See page 382 (ch. 15), *Report of Minnesota Tax Commission, 1912.*

² Calculated from the per cent of maintenance and outlays for schools in class 4 and the figure (\$5.66) found for maintenance and interest in class 5, exclusive of schools.

several classes as between the three large cities. Cost per capita rises from \$11.27 in class 4 to \$16.65 in class 1; cost per \$10,000 of true valuation, on the other hand, decreases from \$135.85 in class 4 to \$107.20 in class 1. Moreover, there appears to be good reason for believing that more of personal property evades taxation in the larger than in the smaller cities; and since the true valuation used in this calculation takes account only of such personal property as actually reaches the tax rolls, the relative decrease of cost with increasing size of city, if measured by the true valuation of all property, would be much more rapid than the above figures indicate.

In like manner, payments for maintenance and interest decrease from \$190.25 in class 4 to \$114.94 in class 1, per \$10,000 of true valuation. The regularity of the gradation is, however, broken by class 3, which has \$192.08 against \$190.25 in class 4. This irregularity is due to the extraordinary extent to which municipalities in class 3 have gone into the management of public utilities, as shown by the receipts from public service enterprises.

The ratio of maintenance and interest to revenue decreases regularly from 88.3 per cent in class 4 to 74.9 per cent in class 1. Again, the per cent of payments for public service enterprises, which is covered by receipts from that source, is least (72.6) in class 4, and increases with the size of the city.² Both of these facts seem to indicate greater economy and efficiency of administration in the larger cities, and to suggest that the law of decreasing expense applies both to regular municipal activities and to the conduct of public utilities, precisely as would be expected under private management. It may be remarked, however, that the ratios given in the table do not allow for principal or interest of public service bonds. If these were included it is likely that the proportion of public service payments met by such receipts would not exceed 50 per cent, on the average, for all municipalities reported.

The ratio of assessed to true valuation rises from 30.17 per cent in class 4 to 38.77 per cent in class 1. But the true valuation per capita increases much faster, going from \$829.79 in class 4 to \$1,553.99 in class 1. As a result the true tax rate for municipal and school purposes is highest in class 4 and lowest in class 1. Class 2, however, is somewhat irregular, showing a higher true

² The ratio of 86.2 in class 1 against 88 in class 2 was due to very heavy outlays for the new filtration plant in Minneapolis and does not represent normal conditions.

tax rate and a lower ratio of debt to true valuation than size would lead one to expect. The apparent explanation is that cities of this class (20,000-5,000) have been compelled to face many of the same urban problems as the three large cities in class 1, though without resorting to as free a use of public credit.

The per cent of net debt to true valuation and the per cent of net interest to tax levy for city and school purposes are higher in the larger than in the smaller cities, with only the irregularity just noted as to class 2. So far as it goes, this fact of course tends to offset the lower cost of government to present taxpayers in the larger municipalities.

So many and such striking variations with size convey a tantalizing suggestion of some regular relation, capable of mathematical formulation, between population, true valuation, and cost of government. The method of empirical curves cannot be used successfully owing to the great gap between classes 1 and 2. The ratio plan yields the results indicated in table 3.

According to table 3, the per capita cost of government increased 8.08 cents for each 1,000 additional population, between classes 4 and 3 (1,570 to 3,427 population); 11.67 cents between classes 3 and 2 (3,427 to 8,483 population); and 2.37 cents between classes 2 and 1 (8,483 to 204,068 population): the weighted average of the three amounts being 2.65 cents.³ These amounts translated into per cents become respectively 0.717, 1.022, and 0.197; the weighted average of the three rates being 0.222 per cent. In view, however, of the fact that an increase of 1,000 in population imposes a much greater strain on a small than on a large municipality, a proportional plan seems likely to be more nearly accurate. On this basis, each 10 per cent increase in population involved an increase in per capita cost of government of 1.27 cents between classes 4 and 3, 4 cents between classes 3 and 2, and 2.01 cents between classes 2 and 1; the weighted average being 2.09 cents. Stated as rates, these increases become respectively 0.113, 0.350, and 0.167 per cent; the weighted average of the three rates being 0.175 per cent.

³ Owing to the great difference in the intervals separating the several classes of municipalities, a simple average of the increases in cost for each 1,000 additional population would have little significance. The average given (2.65 cents) is therefore calculated by weighting the several rates of increase in proportion to the extent of the intervals over which such rates apply: that is, using 8.08 cents .857 times, 11.67 cents 5.056 times, etc. The same principle is followed in calculating the other weighted averages in this table.

TABLE 3.—Effect of size of city on true valuation and on cost of municipal government, in Minnesota, fiscal year 1911.

	Class 4 ¹	Class 3 ¹	Class 2 ¹	Class 1	Totals	Averages
I. Number of municipalities included ³	89	23	17	3	132	88
II. Total population, 1911 ⁴	139,686	78,814	144,209	612,205	974,914	7,386
III. Average population of municipalities, 1911.....	1,570	3,427	8,483	204,068	\$1,270,855,131.00	
IV. Total true valuation, 1911 ⁴	\$115,910,674.00	\$97,267,684	\$136,315,357	\$651,301,436	\$14,405,908.96	
V. Total cost of government, 1911 ⁵	\$1,574,661.13	\$900,245.02	\$1,732,507.32	\$10,198,496.49		
VI. Cost per capita ⁶	\$11.27	\$11.42	\$12.01	\$16.65		\$14.78
Increase in cost per capita.....		\$0.15	\$0.59	\$4.04	\$5.389	
(1) for each 1,000 population.....		\$0.0808	\$0.1167	\$0.0237		\$0.0215
(a) amount of increase in cost ⁷		0.717	1.022	0.197		0.222
(b) per cent of increase in cost ⁸						0.0219
(2) per 10 per cent increase in population.....		\$0.0127	\$0.0400	\$0.0201		0.175
(a) amount of increase in cost ⁹		0.113	0.350	0.107		
(b) per cent of increase in cost ¹⁰						\$1303.56
VII. True valuation per capita ⁶	\$529.79	\$553.50	\$945.26	\$1553.99	\$724.209	
Increase in true valuation per capita.....		\$23.71	\$91.76	\$608.73		
(1) for each 1000 population.....		\$12.77	\$13.15	\$3.11		\$3.57
(a) amount of increase in valuation ⁷		1.589	2.127	0.329		0.385
(b) per cent of increase in valuation ⁸		\$2.00	\$6.22	\$2.64		\$2.82
(2) per 10 per cent increase in population.....		0.241	0.729	0.279		0.303
(a) amount of increase in valuation ⁹						
(b) per cent of increase in valuation ¹⁰						
VIII. Ratio between ratios of increase in cost per capita and increase in true valuation per capita.....						
(1) for each 1000 population.....		46.59	48.05	59.88		57.66
(2) per 10 per cent increase in population ⁸		46.47	48.01	59.86		57.76
IX. Cost per \$10,000 true valuation ⁶	\$135.85	\$133.83	\$127.10	\$107.20	\$28.05 ¹⁰	\$113.36
Decrease in cost per \$10,000 true valuation.....		\$2.02	\$6.73	\$19.40		
(1) for each 1000 population.....		\$1.09	\$1.33	\$0.10		\$0.14
(a) amount of decrease in cost ⁷		0.802	0.994	0.079		0.108
(b) per cent of decrease in cost ⁸						
(2) per 10 per cent increase in population.....		\$0.17	\$0.46	\$0.09		\$0.11
(a) amount of decrease in cost ⁹		0.125	0.344	0.071		0.089
(b) per cent of decrease in cost ¹⁰						

¹ Excluding the mineral towns.² Weighted in proportion to the intervals between classes.³ From analysis table K, *Report of Minnesota Tax Commission, 1912*. ⁴ From analysis table J, *ibid*. ⁵ From table X, I, A, a, b, c, e, (less mineral towns), *ibid*.⁶ From table 2. ⁷ The ratio of VI (1) b to VII (1) b.⁸ The ratio of VI (2) b to VII (2) b. ⁹ Total increase between classes 4 and 1.¹⁰ Total decrease between classes 4 and 1.

It is perhaps significant that the rate of increase in per capita cost for each 10 per cent increase in population rises from 1.27 cents between classes 4 and 3 to 4 cents between classes 3 and 2, and declines again to 2.01 cents between classes 2 and 1. This sharp upward turn in the per capita cost of municipal government is no doubt due to the first contact with true urban problems; and it presumably extends considerably beyond the 8,483 size, though the enormous gap between classes 2 and 1 in Minnesota (8,483 to 204,068) prevents a definite solution of this problem. That this upward "bulge" extends even beyond the 30,000 size, however, is indicated by the fact that group IV, as reported by the Census Bureau, shows a per capita cost slightly higher than group III. In view of this high rate of increase during the first part of the interval, and the fact that the average increase between classes 2 and 1 is only 2.01 cents, it follows that the rate of increase must fall below 2.01 beyond 100,000 population, and probably approaches 1 cent increase per capita for each 10 per cent increase in population, as the 200,000 size is approached. Corroborative evidence on this point is found in the rate of 1.356 cents between groups III and II (70,829 to 159,632 population) as reported by the census for 1910 (table 4).

This decreasing rate of increase in the per capita cost of municipal government, in spite of constant expansion of municipal functions with increase of population, would seem to suggest that municipal activities obey the law of diminishing expense or increasing returns.

Using the same methods, the true valuation per capita is found to increase for each 10 per cent increase in population \$2.00 or 0.241 per cent between classes 4 and 3; \$6.22 or 0.729 per cent between classes 3 and 2; \$2.64 or 0.279 per cent between classes 2 and 1. Here again, as in the case of per capita costs, the transition to true urban conditions is marked by a sharp rise in the rate of increase; but this rise is more pronounced in true valuation than in per capita costs. On the average, for all classes, each 10 per cent increase in population is marked by an increase of \$2.82 or 0.303 per cent in true valuation per capita.

Comparing these several rates of increase (part VIII, table 3), it appears that for each 10 per cent increase in population, the increase of per capita cost averaged only 57.76 per cent of the increase in true valuation of property actually listed on the tax rolls. In other words, allowing for property not listed, it is safe to say that per capita wealth in Minnesota increases from small

to large cities, approximately twice as fast as per capita cost of municipal government.

It should be noted, however, that while between classes 4 and 3 the per capita cost increases only 46.47 per cent as fast as the per capita valuation, the corresponding rate of increase is higher the larger the municipalities, being 59.86 per cent between classes 2 and 1. This fact may indicate that cost of government tends to overhaul true valuation in the largest urban centers. On this account, as well as for many other reasons, it is greatly to be desired that the Census Bureau should form a separate group of the great cities—say those in the million class—so that the analysis of the relation of cost of government to population and wealth may be made more complete.

In view of these different rates of increase of cost and valuation, the cost of municipal government measured by true valuation necessarily decreases as the population increases. The decrease in cost on each \$10,000 of true valuation is \$2.02 between classes 4 and 3, \$6.73 between classes 3 and 2, and \$19.90 between classes 2 and 1. These amounts are equivalent to a decrease for each 10 per cent increase in population, of \$0.17 or 0.125 per cent between classes 4 and 3; \$0.46 or 0.344 per cent between classes 3 and 2; and \$0.09 or 0.071 per cent between classes 2 and 1. The weighted average decrease in cost of government, measured by true valuation, was thus \$0.11 or 0.089 per cent for each 10 per cent increase in population. Between classes 3 and 2, where the increase in per capita cost is most marked, the decrease in cost measured by true valuation is still more pronounced because it is precisely at this point that the true valuation rises most rapidly. The coming of distinctly urban conditions, which impose new burdens on municipal governments, thus augments property values so greatly that the new burdens are borne more easily than the old.

By way of summary it may be pointed out that each increase of 10 per cent in population in the cities and villages of Minnesota, on the average, is accompanied by the following changes stated on the per capita basis:

	Amount of change	Per cent of change
	Cents	
Increase in cost	2.09	0.175
Increase in true valuation	2.82	0.303
Decrease in cost per \$10,000 true valuation	11.00	0.089

Groups, IV, III, and II of the census classification are intermediate as to average size between class 2 and class 1 in Minnesota (table 3). They are also intermediate in cost per capita, as appears from the following tabulation:

Table 4.—*Per capita cost of government.*

Class or group	Average population	Per capita cost
Class 4, Minnesota	1,570	\$11.27
Class 3, "	3,427	11.42
Class 2, "	8,483	12.01
Group IV, United States	37,805	13.02
Group III, " "	70,829	13.00
Group II, " "	159,632	14.70
Class 1, Minnesota	204,068	16.65
Group I, United States	844,106	23.85

For the sake of comparison, a table is here presented, based on the 1910 census, of all cities in the United States having over 30,000 population. Group IV includes 75 cities between 30,000 and 50,000 population; group III, 59 cities between 50,000 and 100,000; group II, 32 cities between 100,000 and 300,000; and group I, 18 cities over 300,000 population.

The federal groups, like the classes in Minnesota, show an increase in per capita cost with size of city except between groups IV and III. This irregularity, like the one noted in table 3, suggests that there may be certain sizes which call for a new and more expensive type of municipal plant and administration—in other words, which temporarily bring into operation the law of increasing expense; and that thereafter, with continued increase of size, the economy of large-scale operation again makes itself felt to the extent of checking, temporarily, the increase of per capita cost and presumably causing a sharp drop in the cost measured by true valuation.

Again, the increase in per capita cost between groups III and II (item VI (2) under group II, table 5) is 13.56 cents or 1.043 per cent, corresponding closely to the rate suggested by the Minnesota figures for cities of this size; while between groups II and I, the increase in per capita cost is 21.34 cents or 1.452 per cent. This fact suggests that just as the interval between class 3 and class 2 marking the transition to urban conditions is signalized by

TABLE 5.—*Showing effect of size of city on true valuation and on cost of municipal government in the United States, in 1910, using the ratios established for Minnesota.*

	Group IV	Group III	Group II	Group I	Totals	Averages
I. Number of municipalities in group ¹	75	59	32	18	184	46
II. Total population, 1910.....	2,855,254	4,178,915	5,108,237	15,198,901	27,316,407	148,459
III. Average population, 1910.....	37,805	70,839	159,632	844,106	\$528,702,829	
V. Total cost of government, 1910 ²	\$36,908,876	\$54,337,205	\$75,136,101	\$362,320,557		19.35
VI. Cost per capita ³	\$13.02	\$13.00	\$14.70	\$23.85	\$10.35	
Increase in cost per capita.....			\$1.70	\$0.15		
(1) for each 1,000 population.....			\$0.0131	\$0.0131		0.0138
(a) amount of increase in cost ⁴			0.147	0.089		0.096
(b) per cent of increase in cost ⁴			\$0.1356	\$0.2184		\$0.1958
(2) per 10 per cent increase in population.....			1.043	1.452		1.359
(a) amount of increase in cost ⁴						
(b) per cent of increase in cost ⁴						
VII. True valuation per capita ⁵	\$1,036.45	\$1,139.16	\$1,415.33	\$3,544.06	\$2,507.61	\$5,517.79 ⁶
Increase in true valuation per capita.....		\$102.71	\$276.17	\$2,123.73		
(1) for each 1,000 population.....		\$3.11	\$3.11	\$3.11		\$3.11
(a) amount of increase in valuation ⁴		0.300	0.273	0.220		0.229
(b) per cent of increase in valuation ⁴		\$11.76	\$22.04	\$49.64		\$39.09
(2) per 10 per cent increase in population.....		1.135	1.934	3.507		2.876
(a) amount of increase in valuation ⁴						
(b) per cent of increase in valuation ⁴						
VIII. Ratio between ratios of increase in cost per capita and increase in true valuation per capita :.....						
(1) for each 1,000 population ⁷						41.79%
(2) per 10 per cent increase in population ⁷						47.25%
IX. Cost per \$10,000 true valuation ⁸	\$124.17	\$120.87	\$111.99	\$68.54	\$80.63	\$76.87 ⁹
Decrease in cost per \$10,000 true valuation.....		\$3.30	\$8.88	\$68.45		
(1) for each 1,000 population.....		\$0.10	\$0.10	\$0.10		\$0.10
(a) amount of decrease in cost ⁴		0.081	0.083	0.089		0.088
(b) per cent of decrease in cost ⁴						
(2) per 10 per cent increase in population.....		\$0.33	\$0.71	\$1.60		\$1.26
(a) amount of decrease in cost ⁴		0.306	0.537	1.429		1.111
(b) per cent of decrease in cost ⁴						

¹ From table 1, *Census Report on Financial Statistics of Cities over 50,000 in 1910*.

² From table 3, *ibid.*, including taxes, licenses and permits, fines, etc.

³ From table 25, same report and items as ².

⁴ Weighted in proportion to the intervals between groups.

⁵ Based on rate of increase in true valuation established between classes 1 and 2 in Minnesota, starting with the same true valuation per capita, at the same size as in class 2, table 3.

⁶ The total true valuation of the four groups, calculated as under ⁵, divided by the total population.

⁷ See table 3, footnotes ⁷ and ⁸.

⁸ Based on rate of decrease in cost between classes 2 and 1, *ibid.* in table 3.

⁹ The total cost for the 4 groups divided by the total true valuation, obtained according to footnote ⁶.

a sharp rise, this still more striking rise in per capita cost is due to the transition from ordinary urban to metropolitan conditions, which again imposes the necessity of providing a more expensive type of municipal plant and administration.

The question arises: Since the census figures for per capita cost in cities over 30,000 correspond so closely to the results in Minnesota that both sets of figures can be arranged in a single ascending series (table 4), are we warranted in assuming that true valuation in these cities outstrips the per capita cost as much as it does in Minnesota? If so, it would follow that the cost of government measured by true valuation would show a corresponding decrease. In order to bring out the effects of such a variation of true valuation with size, sections VII, VIII, IX of table 5 have been prepared. These figures, which are printed in italics to indicate that they are purely hypothetical, are based on the per capita valuation shown for class 2 and the rate of increase between class 2 and class 1 in table 3. According to these figures, there would be for each 10 per cent increase in population a decrease of \$0.38 or 0.306 per cent between groups IV and III; of \$0.71, or 0.587 per cent, between groups III and II; and of \$1.60, or 1.429 per cent, between groups II and I, in the cost of municipal government resting on each \$10,000 of true valuation. If the cities of over 1,000,000 population were put in a separate group, this decrease in cost measured by true valuation would run to highly significant and even startling figures; unless, indeed, cost of government overhauls true valuation.

In the absence of statistical corroboration as to the true valuations outside of Minnesota, it is not safe to place overmuch confidence in this portion of table 5, especially in so far as concerns group I. For this reason, these figures are published less as a solution than as a statement of the problem. If several of the states which employ the sales method of valuing real estate for purposes of taxation should calculate and publish true valuations by municipalities, and if the Census Bureau should make a separate group of the cities of over 1,000,000 population, it would be possible to draw curves showing the average relation of per capita cost, true valuation, and cost measured by true valuation, for each size of municipality. Such a result would certainly be of great interest and value, both theoretical and practical. It is, of course, possible that such statistical data would reveal some size of city which gives the maximum of efficiency, or of true valuation

per capita; but if such is the case, it must be somewhere in group I. On the whole, and barring this possibility, the Minnesota figures seem to show that as cities grow larger, wealth increases practically twice as fast, on the average, as the per capita cost of municipal government.

In a sense, this conclusion is reassuring, but it suggests that this economic advantage tends constantly to make the great city greater still. Certainly the Minnesota figures give no support to the theory that increasing cost of city government will set a limit to the continued and ever increasing congestion of population in urban centers, which imposes the necessity of human adaptation to what is, in effect, a wholly new environment.

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